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Original article

Impact of the COVID-19 epidemic on ENT surgical volume

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ABSTRACT

Purpose: The purpose of this study was to assess the impact of the COVID-19 pandemic on the surgical volume of three ENT departments in Ile-de-France, a region severely affected by the epidemic.

Materials and methods: The number and nature of surgeries was collected from three university hospital ENT departments from 17/03/2020 to 17/04/2020 and from 18/03/2019 to 18/04/2019. Centre 1 is a general adult ENT department specialized in otology, centre 2 is a general adult ENT department specialized in cancer and centre 3 is a paediatric ENT department. Comparative analysis of the decreased surgical volume was conducted between 2019 and 2020.

Objective: To analyse the reduction of ENT surgical volume.

Results: The three centres operated on 540 patients in 2019, versus 89 in 2020, i.e. an 84% decrease: 89% in Centre 1, 61% in Centre 2, and 95% in the paediatric centre. Otological surgery decreased by 97%, endonasal surgery decreased by 91%, head and neck surgery decreased by 54%, plastic surgery decreased by 82%, and transoral surgery decreased by 85%. The number of surgical operations for skin cancer decreased (24 vs. 9), while the total number of head and neck cancer surgeries remained stable (18 vs. 22). The number of planned tracheostomies increased from 8 to 22.

Conclusion: The number of ENT surgeries decreased by 84% during the first month of the COVID-19 epidemic. This decreased surgical volume mainly concerned functional surgery, while the level of cancer surgery remained stable. Hospital units will need to absorb a marked excess surgical volume after the epidemic.

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1. Introduction

A new coronavirus (Severe Acute Respiratory Syndrome Coronavirus 2, SARS-CoV-2), responsible for respiratory tract infections (coronavirus disease 2019, COVID-19) was identified on 7 January 2020 in Wuhan, China. The epidemic rapidly spread all over the world and, by 12 February 2020, 45,179 cases had been confirmed in 25 countries, resulting in 1116 deaths. Enhanced surveillance was implemented in France on 10 January 2020 to rapidly identify imported cases and prevent secondary transmission. Three cases of COVID-19 in France were confirmed on 24 January, the first cases in Europe [1]. The two French regions most severely affected were the Grand-Est and Ile-De-France. Lockdown in France began on 17 March 2020.

Following the lockdown announcement, the *Société française d'Oto-Rhino-Laryngologie et de Chirurgie Cervico-Faciale* recommended that any non-urgent medical or surgical procedures should

be postponed unless postponement represented a loss of chance for the patient, in order to increase the capacity of intensive care units, give priority to admission of patients with COVID-19, and reallocate human and material resources to units managing COVID-19 patients. Another objective was to reduce the risk of contamination of patients attending health care facilities [2]. This reorganization resulted in a restriction of access to operating rooms, consequently resulting in a decreased number of surgeries.

The aim of this study was to assess the impact of the COVID-19 pandemic on surgical volume in three university hospital ENT departments in the Paris region, a region severely affected by the epidemic. This study was carried out by comparing the number of surgeries performed over a one-month period during the pandemic versus the same month in 2019.

2. Materials and methods

Local ethics committee approval was not required, as the French law on clinical research (Law No. 2012-300 dated 5 March 2012) does not apply to this retrospective observational study.

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Table 1
Patient characteristics in 2019 and 2020.

	2019		2020	
	N = 540	%	N = 89	%
Gender				
Male	318	59%	59	66%
Female	222	41%	30	34%
Type of surgery				
Otological	174	32%	6	7%
Grommet	34		1	
Otosclerosis	15		0	
Chronic otitis	74		0	
Otoneurosurgery	18		5	
Hearing implant	33		0	
Endonasal	56	10%	5	6%
Middle meatotomy	20		1	
Ethmoidectomy	12		1	
Septoplasty	17		0	
Emergency	7		3	
Head and neck	97	18%	45	50%
Elective tracheostomy	8		22	
Head and neck cancer surgery	18		22	
Head and neck surgery for benign tumour	68		1	
Emergency	3		2	
Facial	53	10%	10	11%
Facial paralysis rehabilitation	7		1	
Cosmetic surgery	25		0	
Skin cancer	21		9	
Transoral	160	30%	23	26%
Diagnostic endoscopy	54		16	
Transoral surgery	25		2	
Tonsillectomy	68		3	
Cleft/orthognathic surgery	9		0	
Emergencies	4		2	
Aetiologies				
Non-skin cancers	47	9%	35	39%
Skin cancers	24	4%	9	10%
Emergencies	14	3%	7	8%
Functional surgery	455	84%	38	43%
Centre				
Centre 1	228	42%	27	30%
Centre 2	137	26%	54	61%
Centre 3	175	32%	8	9%

We studied two periods of 23 working days: from 17 March 2020 to 17 April 2020 and from 18 March 2019 to 18 April 2019. All patients operated under general anaesthesia during these two periods were included, with no exclusion criteria. Data were collected retrospectively from three university hospital ENT departments in the Paris region by examining the operating room schedules in each hospital. This digital table can be consulted via Orbis® software (Agfa Healthcare). Centre 1 is a general adult ENT department specialized in otology, otoneurosurgery and facial paralysis rehabilitation, centre 2 is a general adult ENT department specialized in cancer and centre 3 is a general paediatric ENT department.

We defined five groups of surgery, according to anatomy: otology/otoneurosurgery, endonasal surgery, head and neck surgery, facial surgery, and transoral surgery. Subcategories are presented in Table 1.

We also defined four groups of patients according to aetiologies: cancer (except for skin cancer), skin cancer, emergencies and functional surgery.

A descriptive analysis of the decrease in total surgical volume and according to the type of procedure between 2019 and 2020 was carried out. All analyses were performed with R software (v.3.6.0; 2020-04-26).

3. Results

Six hundred and twenty-nine patients (255 patients in Centre 1, 191 patients in Centre 2 and 183 patients in Centre 3) were included, comprising 40% of females.

In 2019, the mean number of surgical sessions per week was 17.5 in Centre 1, 12 in Centre 2, and 10 in Centre 3. In 2020, these numbers were 3.7, 4.15 and 1.1, respectively. The total number of surgeons remained unchanged between 2019 and 2020, with the exception of Centre 2 (one less surgeon compared to 2019).

Five hundred and forty patients were operated on in 2019 compared to 89 in 2020, representing an overall 84% decrease in surgical volume, with an 88% reduction in Centre 1, a 61% reduction in Centre 2 and a 95% reduction in the paediatric centre. Otological, endonasal, head and neck, facial and transoral surgery decreased by 97%, 91%, 54%, 82% and 85%, respectively.

Patient characteristics by type of surgery, aetiology, gender and centre, in 2019 and in 2020, are presented in Table 1.

The number of surgeries for skin cancer decreased (24 vs. 9), while the total number of head and neck cancer surgeries remained stable (18 vs. 22). The number of emergency procedures was halved (14 to 7) and the number of planned tracheostomies increased from 8 to 22.

4. Discussion

The total surgical volume in our three university hospital ENT departments decreased by 84%, mainly due to the marked reduction of functional surgery, while head and neck cancer surgery was maintained.

Five of the 6 otological procedures performed in 2020 were for stage IV acoustic neuroma, corresponding to critical cases. We

could not find any obvious explanation for the decrease in the total number of ENT and maxillofacial emergencies requiring surgery. However, the reduction of the number of cases of facial trauma related to lockdown is a possible explanation.

In Seattle, USA, the mean weekly surgical volume in a vascular surgery unit decreased by 71.7% [3]. In Milan, Italy, in maxillofacial surgery units, outpatient surgery decreased by 86% and conventional surgery decreased by 78% [4]. In San Francisco, the general surgery department reduced its operating room activity by 80% [5]. In Marseille, France, during the first month of lockdown, the number of cases of spinal surgery decreased by almost 50% [6].

However, the number of planned tracheostomies increased. Patients with COVID-19-related acute respiratory distress syndrome may require prolonged intubation, justifying tracheostomy [7] and ENT surgeons were logically asked to perform this procedure. The strategy adopted by many intensive care units in the context of the COVID-19 epidemic was to perform early tracheostomy in order to wean intubation in certain patients with severe ARDS, allowing them to be transferred to a ventilatory weaning unit, thereby freeing up intensive care unit beds for new patients [8,9].

To our knowledge, this is the first study to compare total ENT surgical volume between a peak period of the COVID-19 pandemic and a comparable period in the previous year. The only published study in our specialty concerned head and neck cancer surgery in the USA, and reported a 55% decrease in surgical volume [10]. Our 3 different departments represent a good sample of the volume of ENT surgeries performed in the Paris region. Unfortunately, endonasal surgery accounted for only 10% of our total surgical volume in 2019, but the fact that only 5 endonasal procedures were performed in 2020 is sufficient to highlight the marked reduction of the volume of this surgery.

These data can be very useful for post-crisis management and for management of a hypothetical future health crisis.

A total of 84% of planned procedures were cancelled and will therefore be rescheduled. A significant excess surgical volume can therefore be expected over the coming months, which will require appropriate management. Postponement of these operations can also be expected to result in spontaneous progression of disease, with patients presenting at more advanced stages of their disease or with more complex conditions.

During a subsequent health crisis, we must therefore be immediately able to select those patients in whom surgery can be delayed, while maintaining a high surgical volume in order to avoid an excessive wave after the crisis.

In the Paris region, during the month of April 2020, all patients requiring intensive care were able to be adequately treated. Hospitals in the Paris region were not overwhelmed, although, at a certain point, the government had to equip trains in order to transfer patients to other regions. Cancer surgery was therefore able to be maintained during this period. It should be noted that most

ENT procedures for cancer can be performed without the need for postoperative admission to the intensive care unit. The impact of ENT surgical volume on ICU beds is therefore minimal in the context of a pandemic. In the event of a future serious health crisis, we should therefore define three priorities: stop the spread of the virus, manage infected patients, and avoid loss of chance for other patients.

5. Conclusion

The number of ENT surgeries decreased by 84% during the first month of the COVID-19 epidemic. This decreased surgical volume mainly concerned functional surgery, while cancer surgery was maintained. Hospitals will need to absorb a major excess surgical volume during the post-crisis period.

Disclosure of interest

The authors declare that they have no competing interest.

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